

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER

Inventors: Donald B. Eidson, et al.

Application No. 09/887,877

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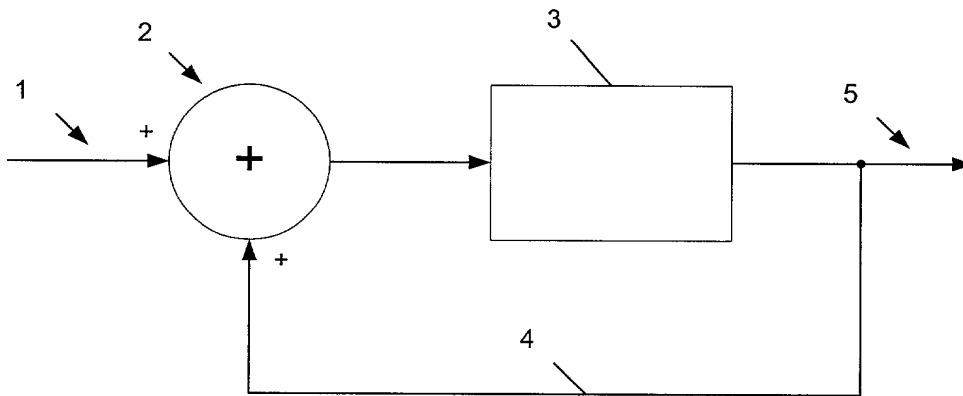


FIGURE 1A

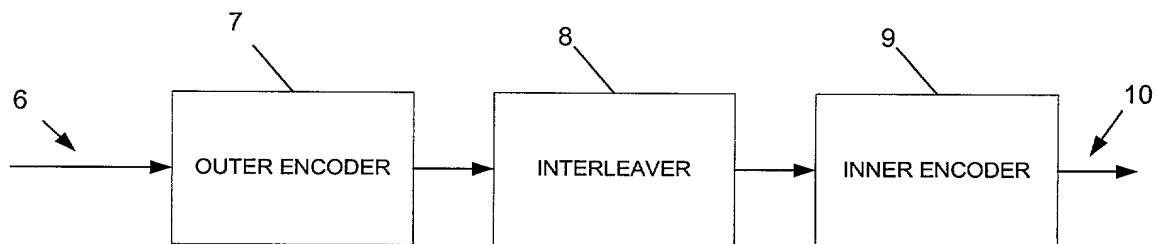


FIGURE 1B

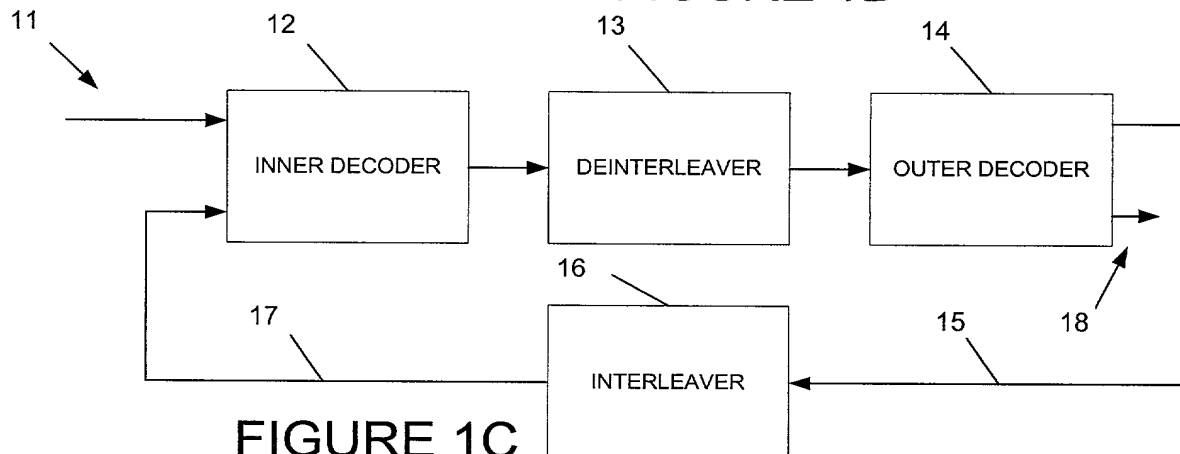


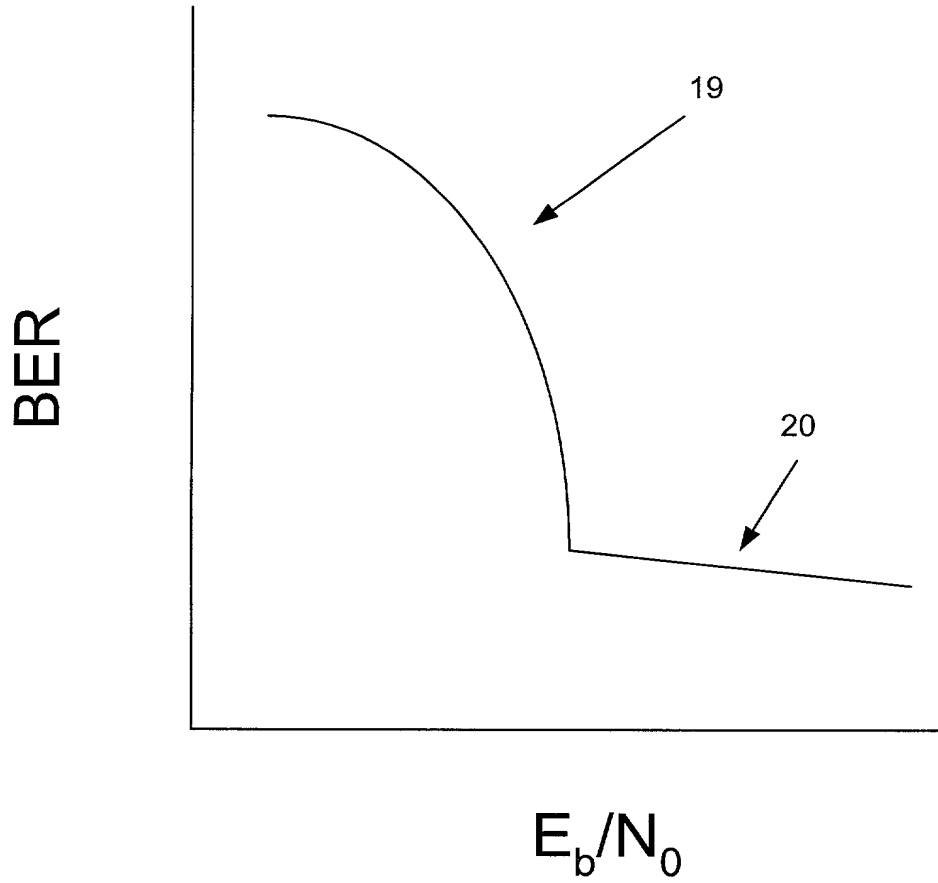
FIGURE 1C

**RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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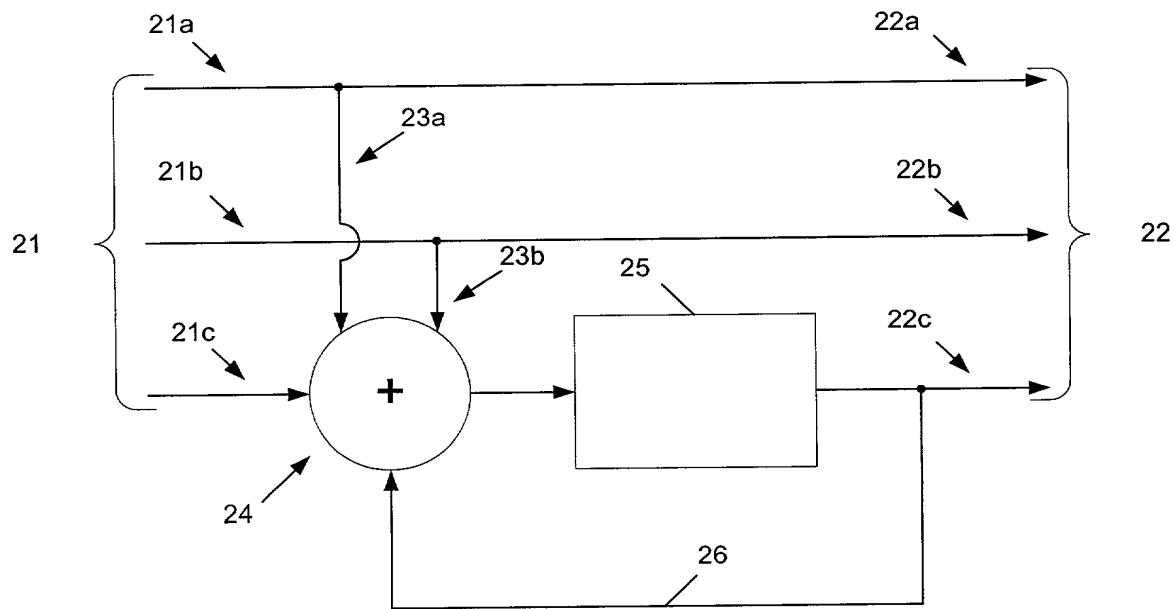
**FIGURE 2**

**RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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**FIGURE 3A**

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER

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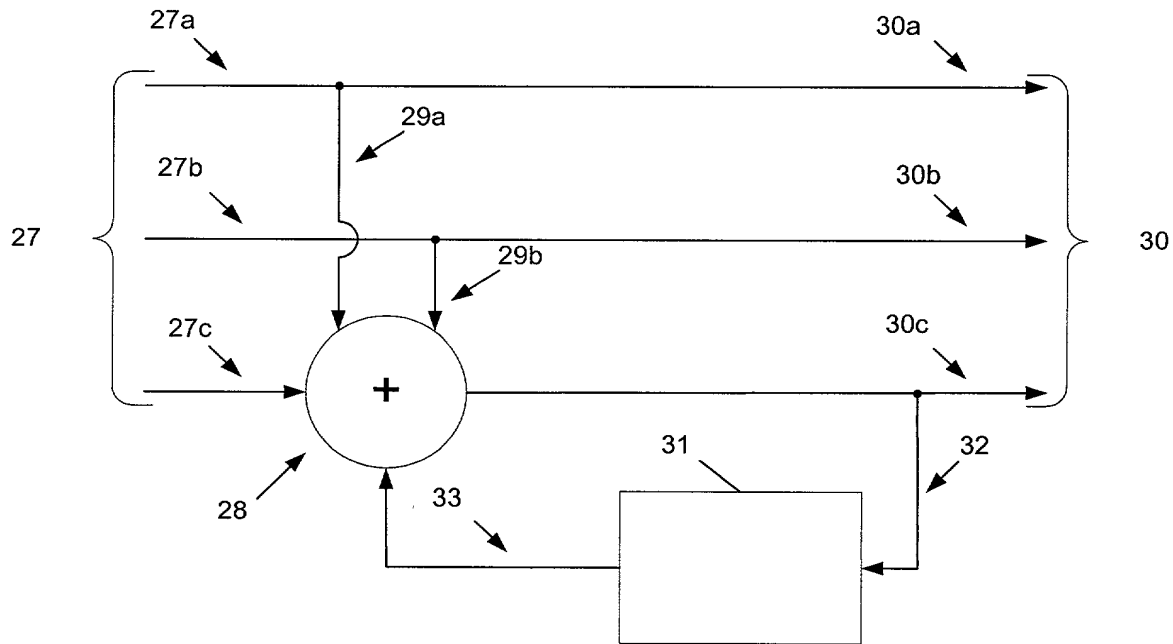


FIGURE 3B

# RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

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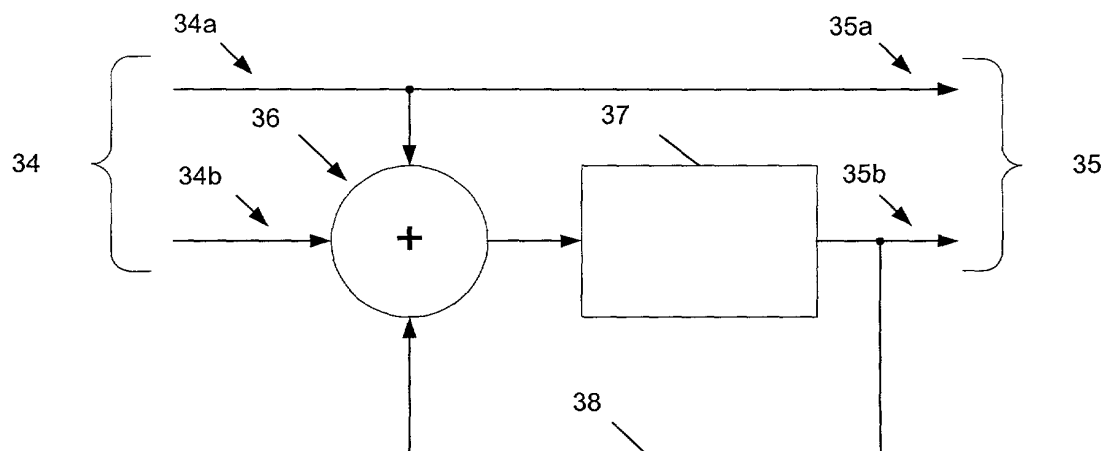


FIGURE 4

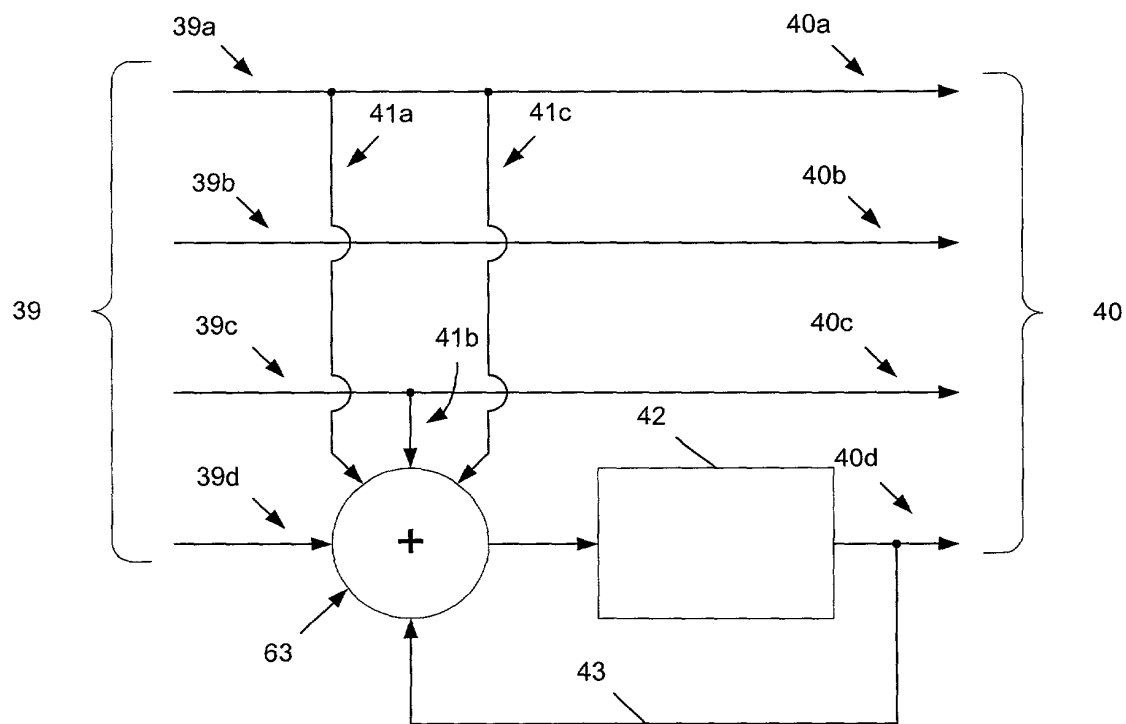


FIGURE 5

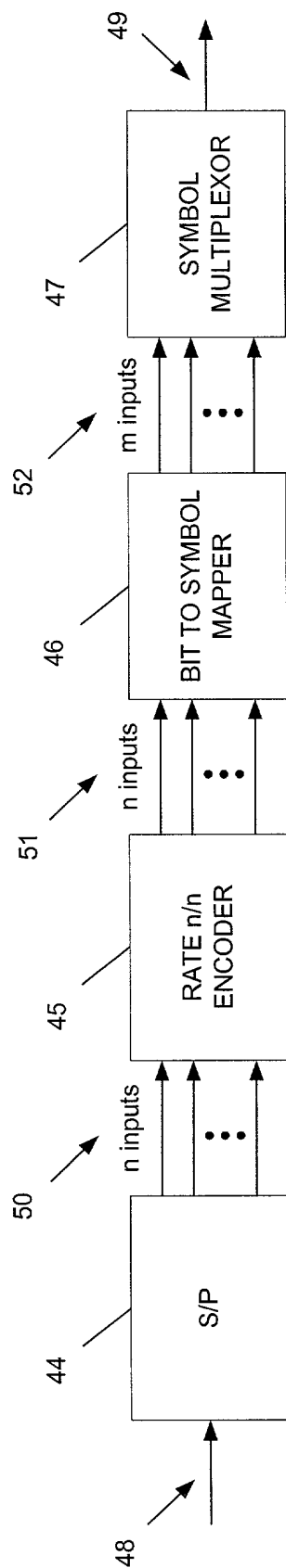
FIG. 4

**RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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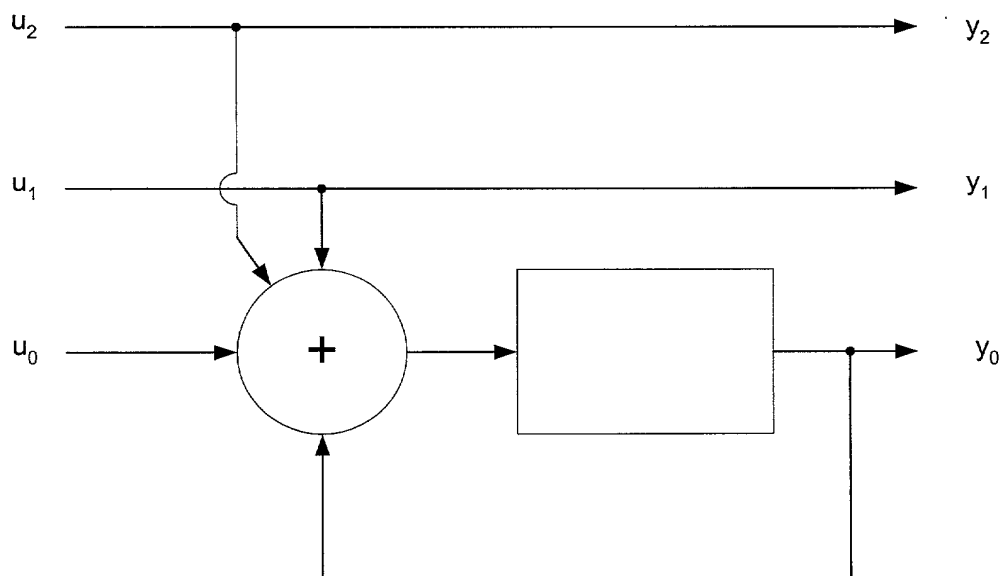
**FIGURE 6**

**RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER**

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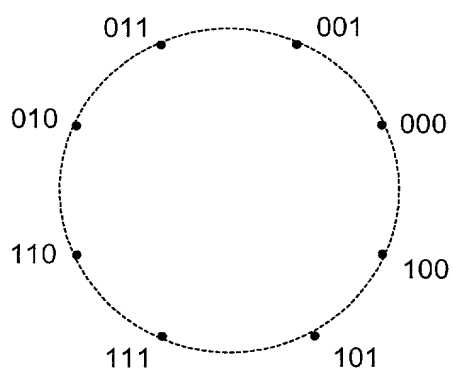
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**FIGURE 7A**

**8-PSK SYMBOL INDEXING**  
( $y_2, y_1, y_0$ )



**FIGURE 7B**

# RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

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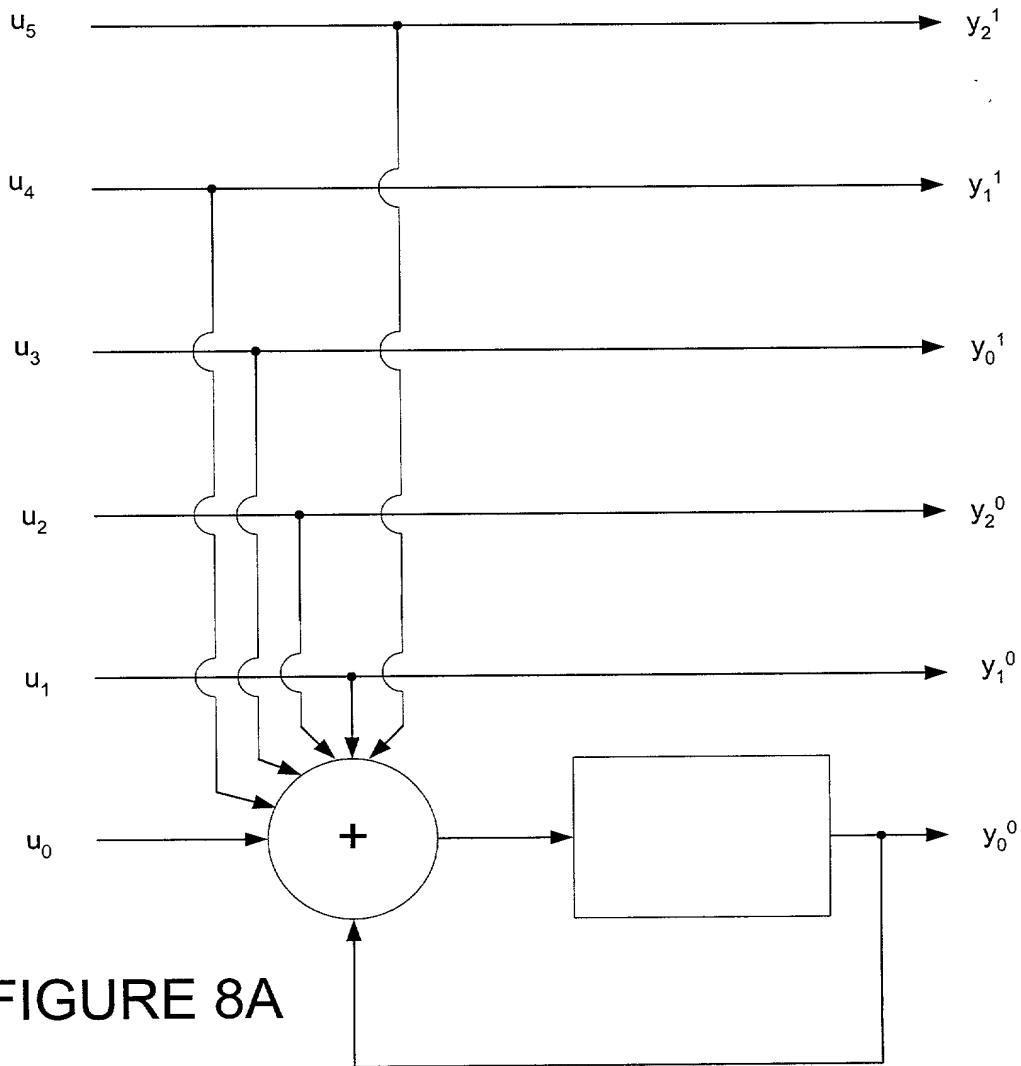


FIGURE 8A

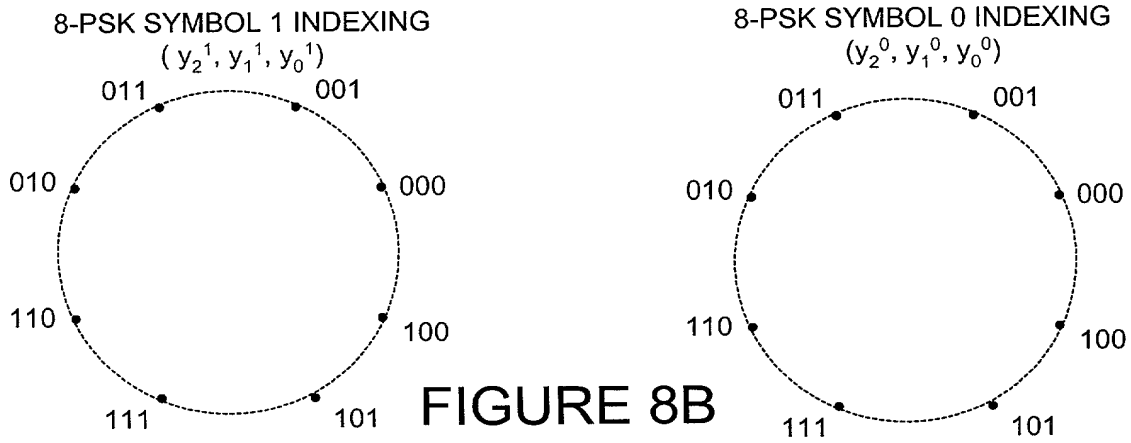


FIGURE 8B

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# RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

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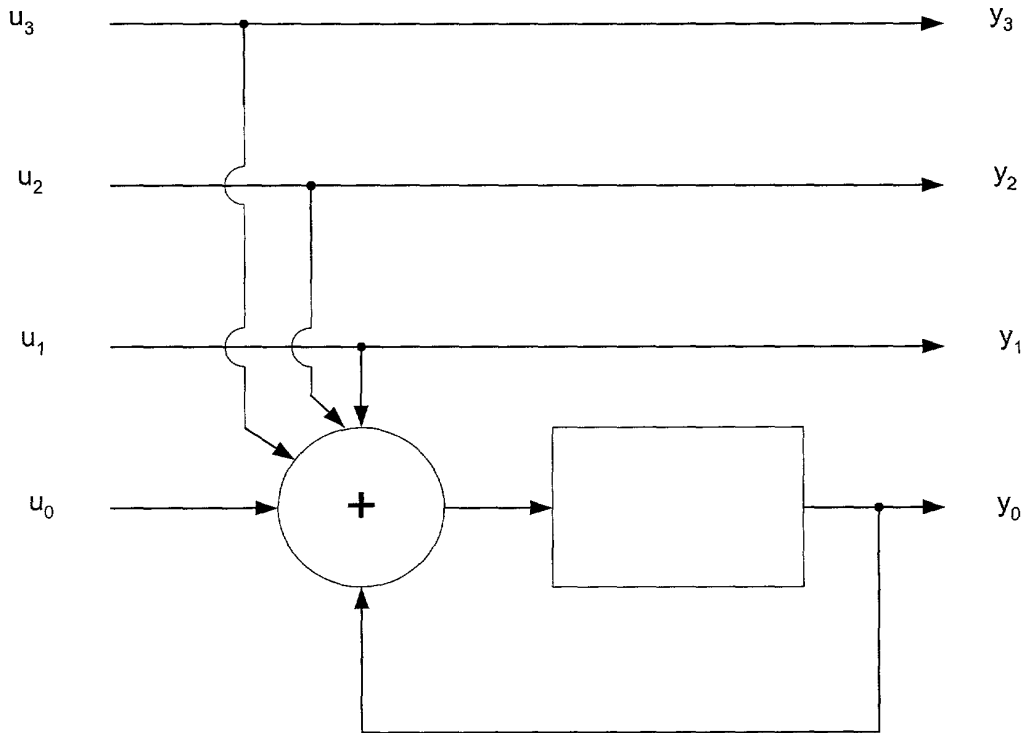


FIGURE 9A

16-QAM symbol indexing

( $y_3, y_2, y_1, y_0$ )

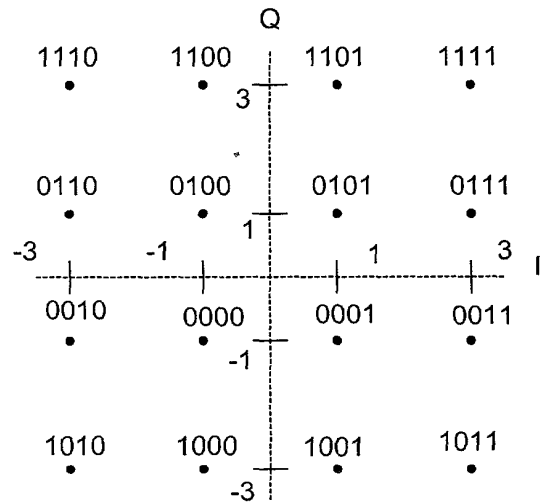


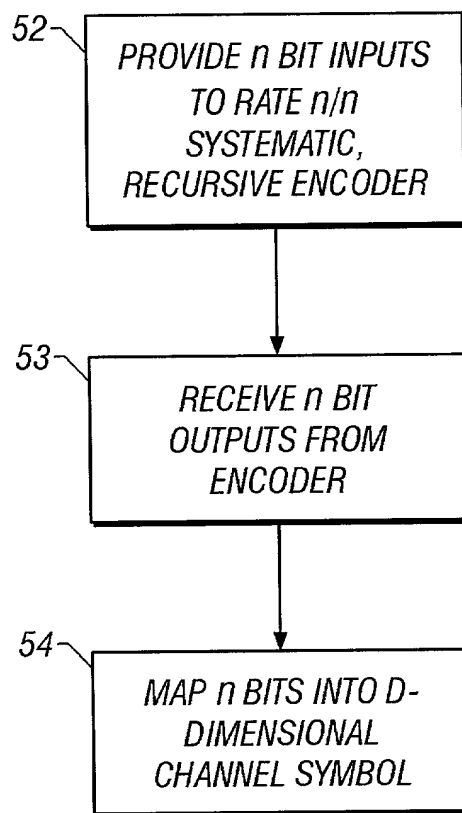
FIGURE 9B

**RATE  $N/N$  SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER**

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**FIG. 10**

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER

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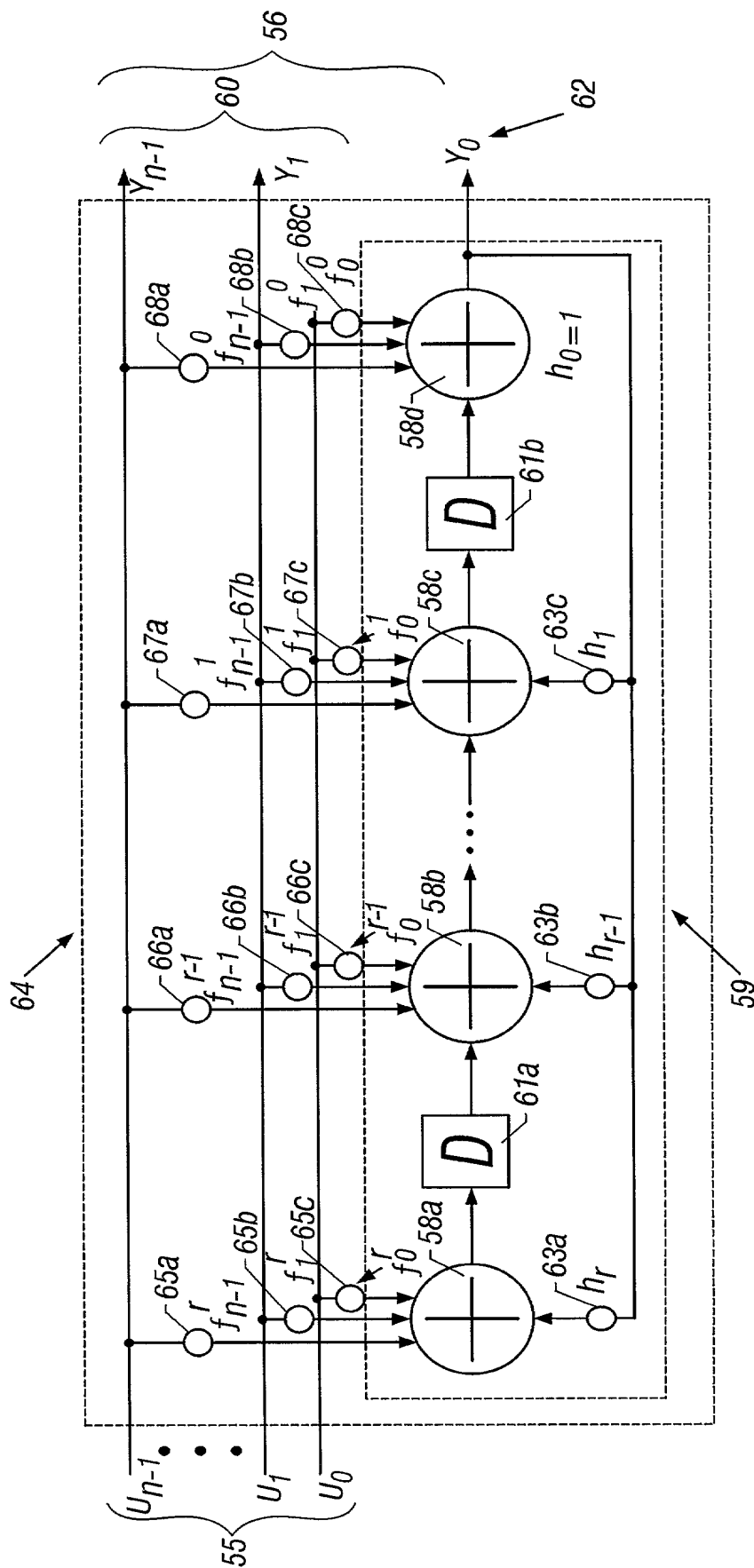


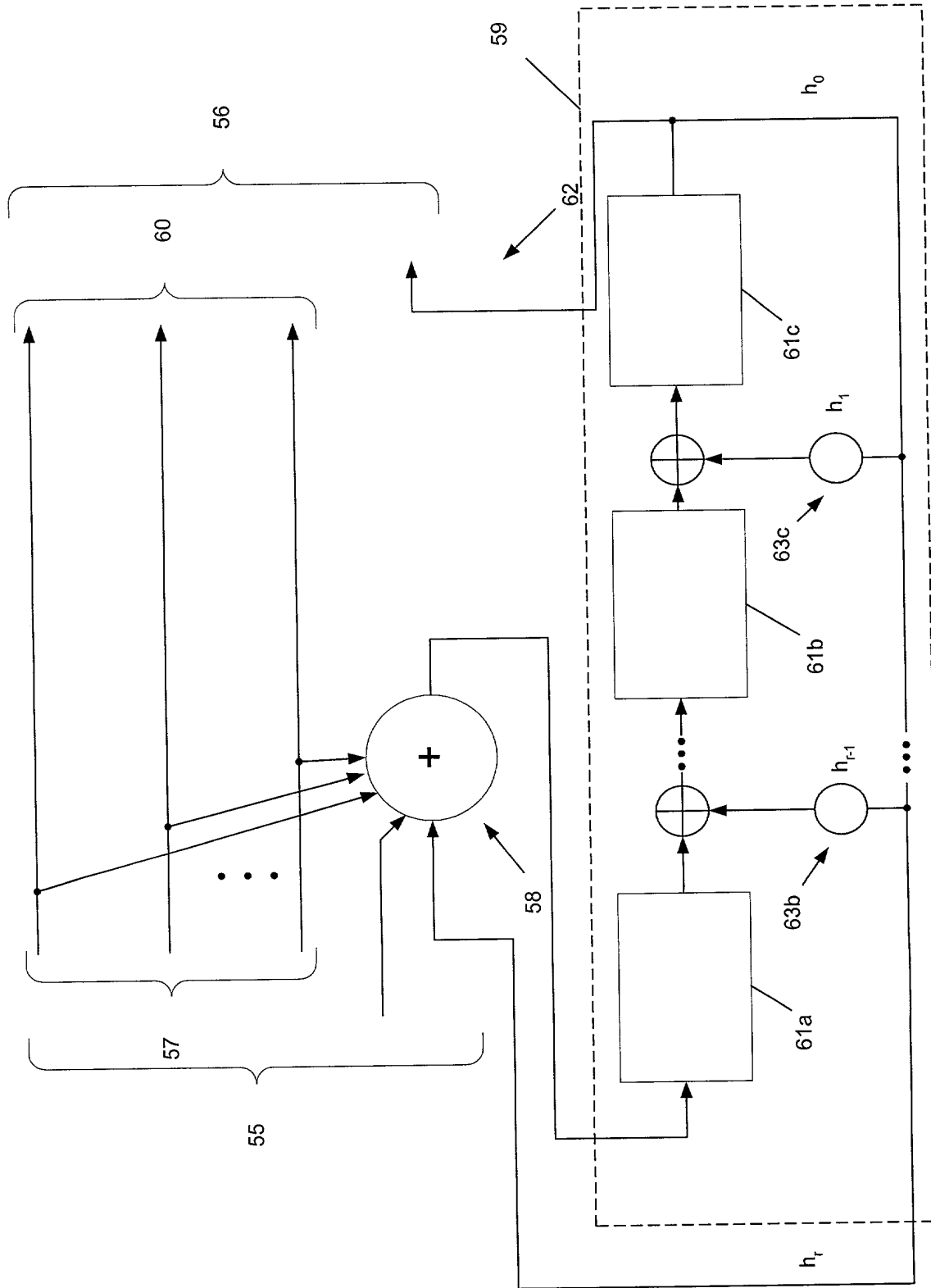
FIG. 11A

**RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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**FIGURE 11B**

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER

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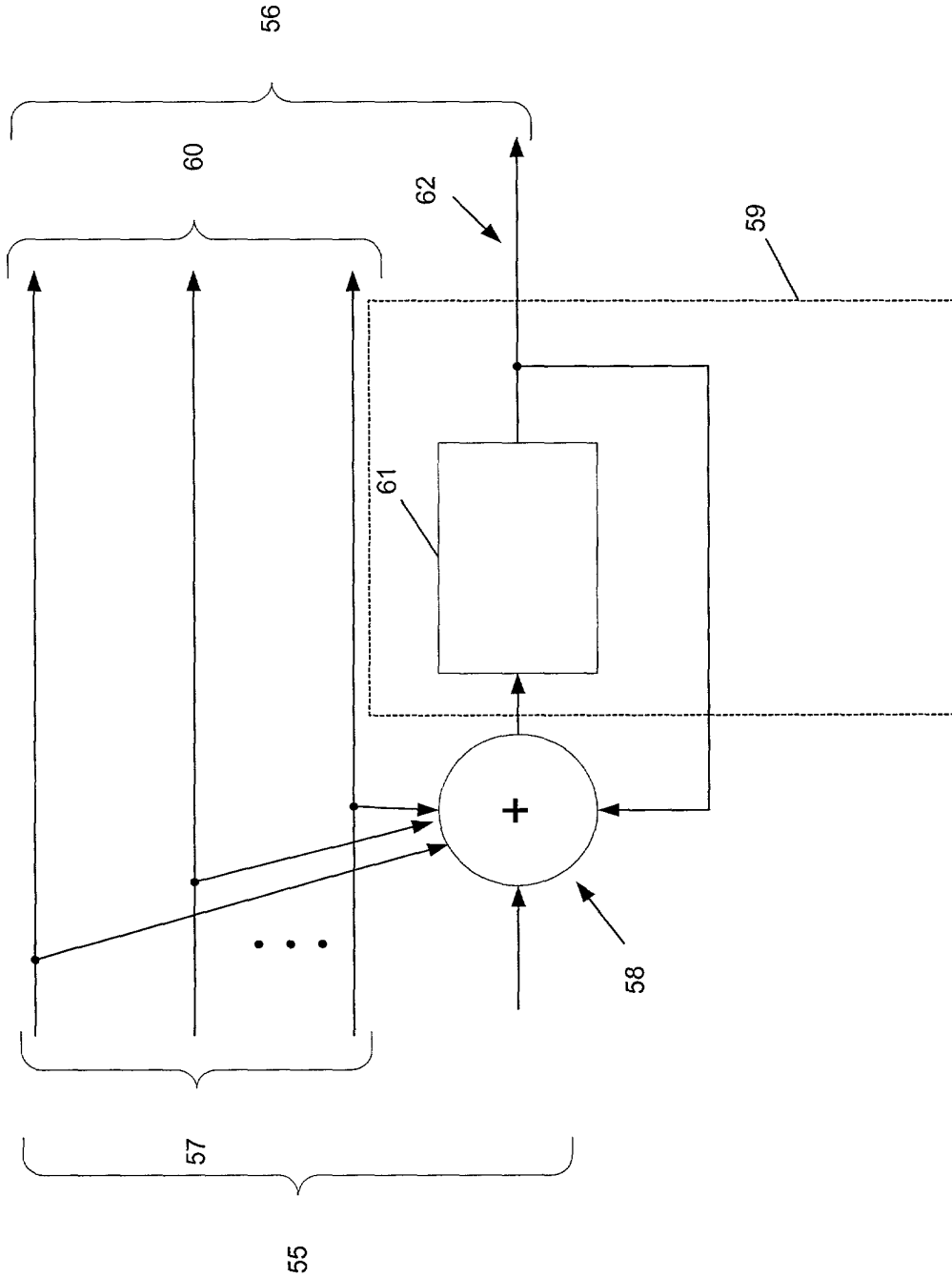


FIGURE 11C

FIGURE 11C

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER

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**Rate 3/4 overall 8-PSK SCTCM performance: comparison of rate 3/3, 6/6, and 5/6 inner codes 15147-bit source data payload per block (BER floor estimated using Union Bound)**

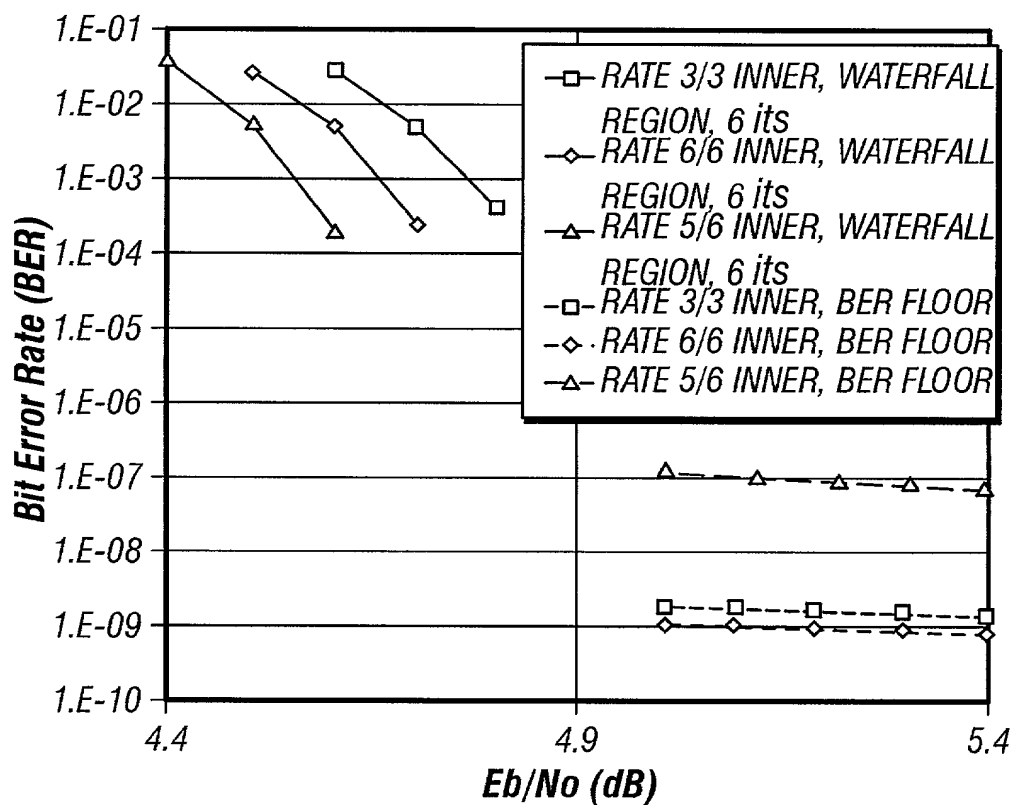


FIG. 12A

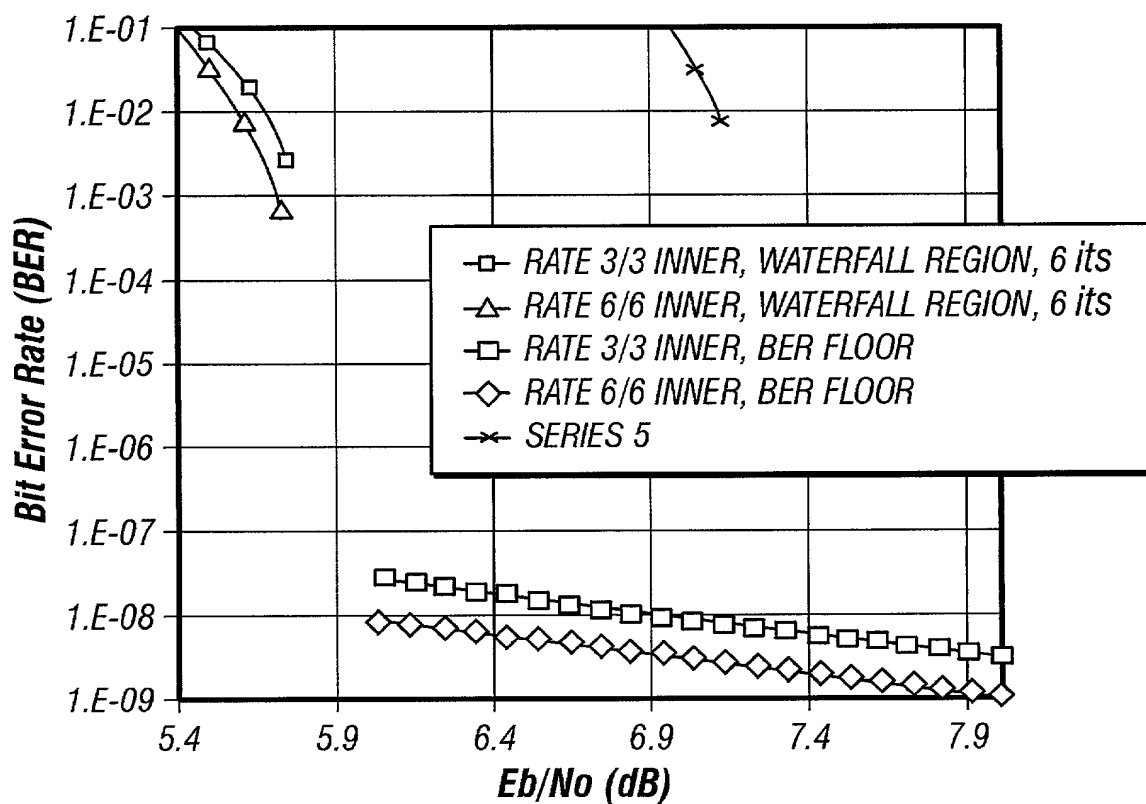
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ENCODER AND CORRESPONDING DECODER**

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**Rate 5/6 overall 8-PSK SCTCM performance: rate 3/3 inner code  
vs rate 6/6 inner code 15125-bit source data payload per block  
(BER floor estimated using Union Bound)**



**FIG. 12B**

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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**Rate 8/9 overall 8-PSK SCTCM performance: rate 3/3 inner code  
vs rate 6/6 inner code 15128-bit source data payload per block  
(BER floor estimated using Union Bound)**

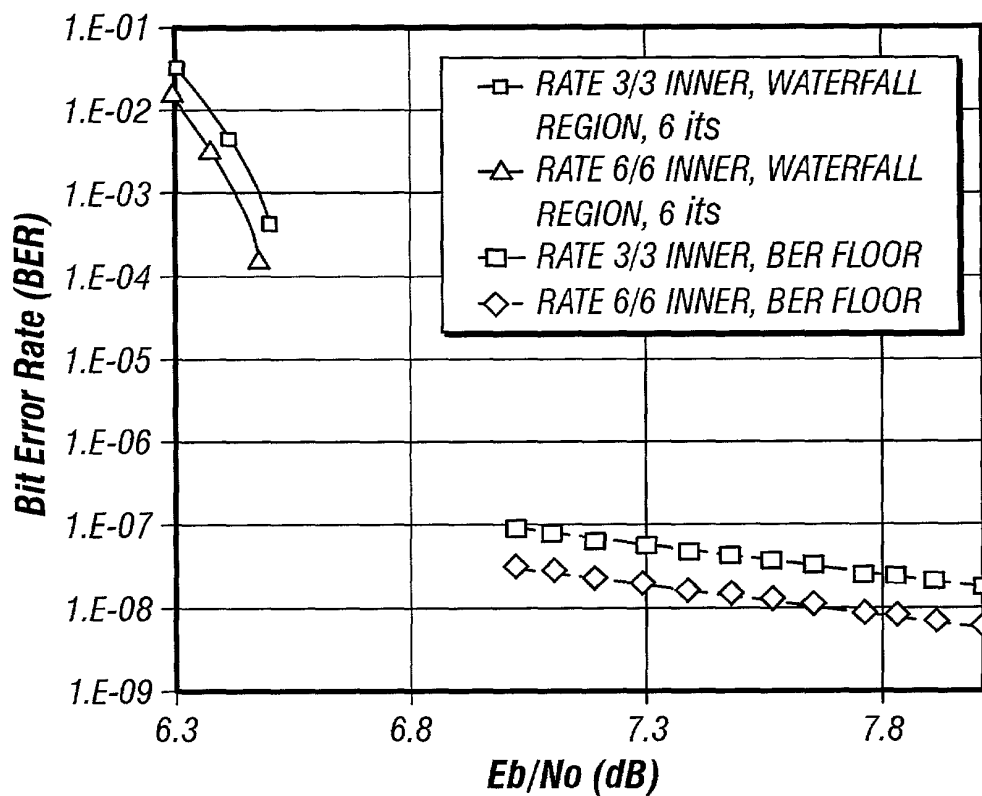


FIG. 12C



RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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**Rate 4/5 overall QPSK SCCC performance: rate 2/2 inner code  
vs rate 4/4 inner code 16384-bit source data payload per block  
(BER floor estimated using Union Bound)**

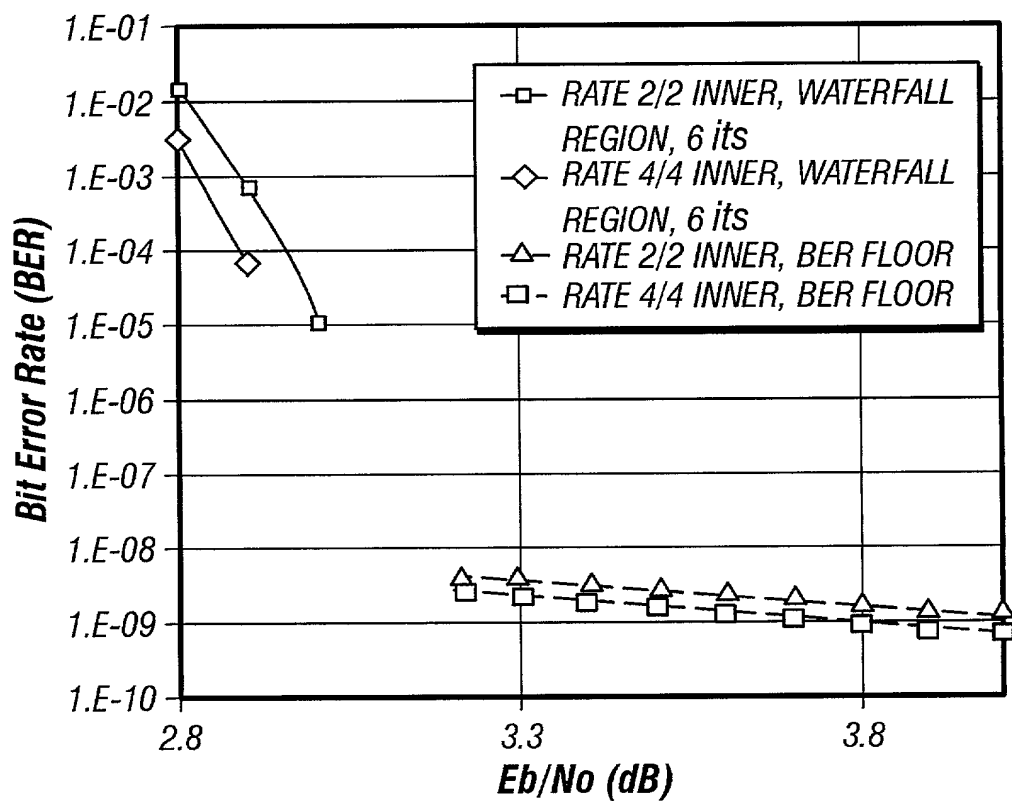


FIG. 12D

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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**Simulated (Waterfall) Performance**  
**Rate 2/3 Overall, 15144 source bits, 5 iterations**

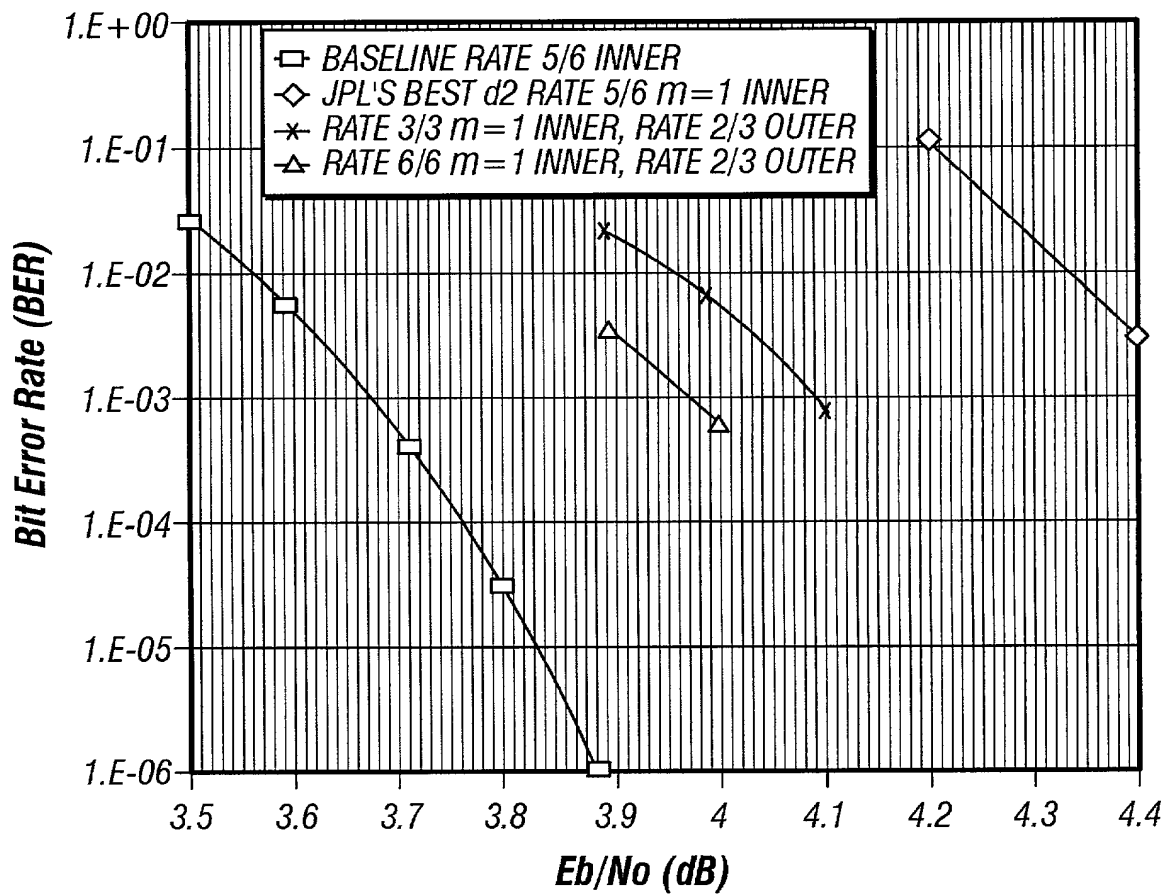


FIG. 13A

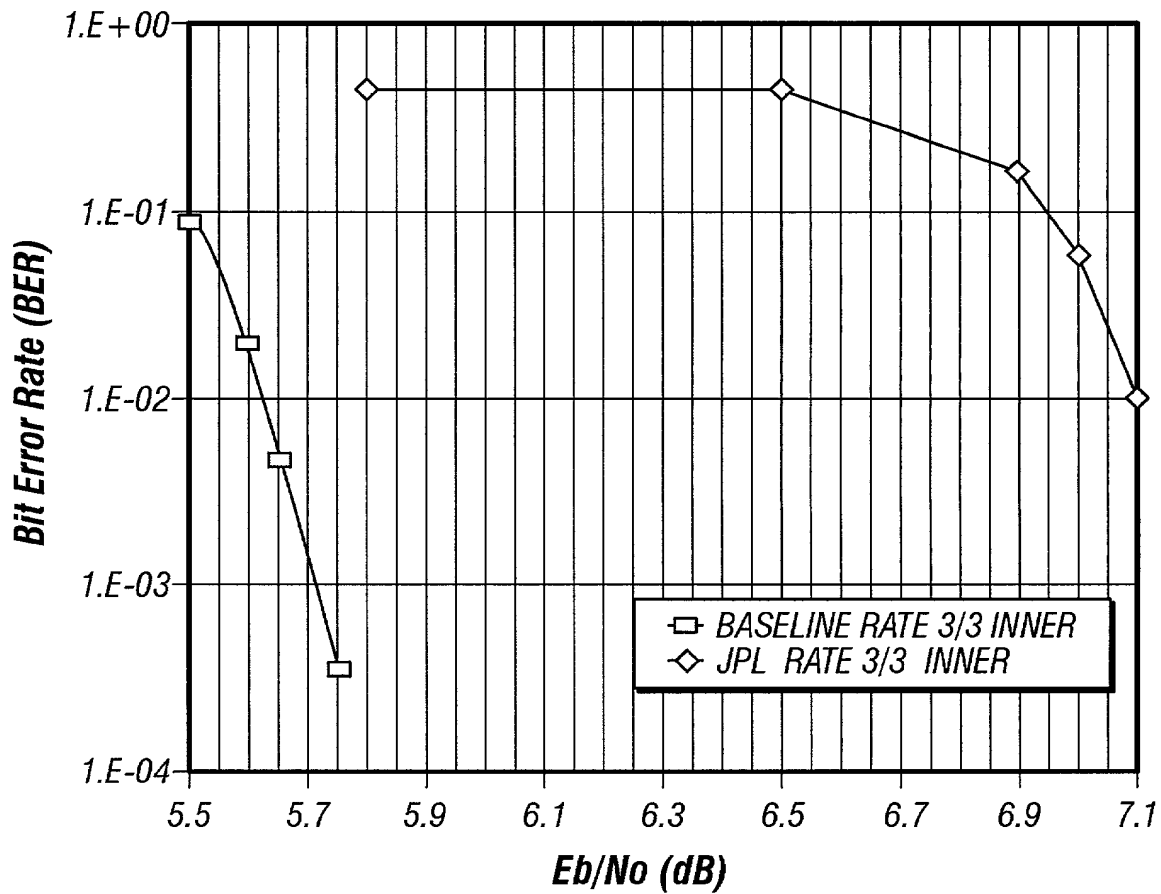
RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER

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**Simulated (Waterfall) Performance**  
**Rate 5/6 Overall, (15147 source bits per block, 6 iterations)**



**FIG. 13B**

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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**Rate 5/6 overall 8-PSK SCTCM**  
**Performance: Rate 3/3 inner code vs rate 6/6**  
**inner code**

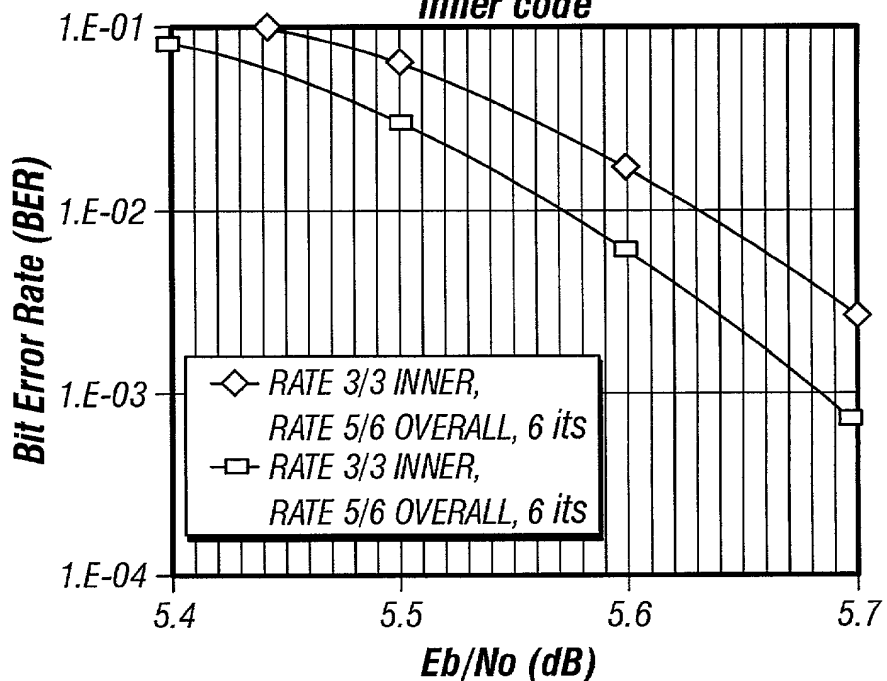


FIG. 13C

**Rate 5/6 overall 8-PSK SCTCM**  
**Performance: Rate 3/3 inner code vs rate 6/6**  
**inner code**

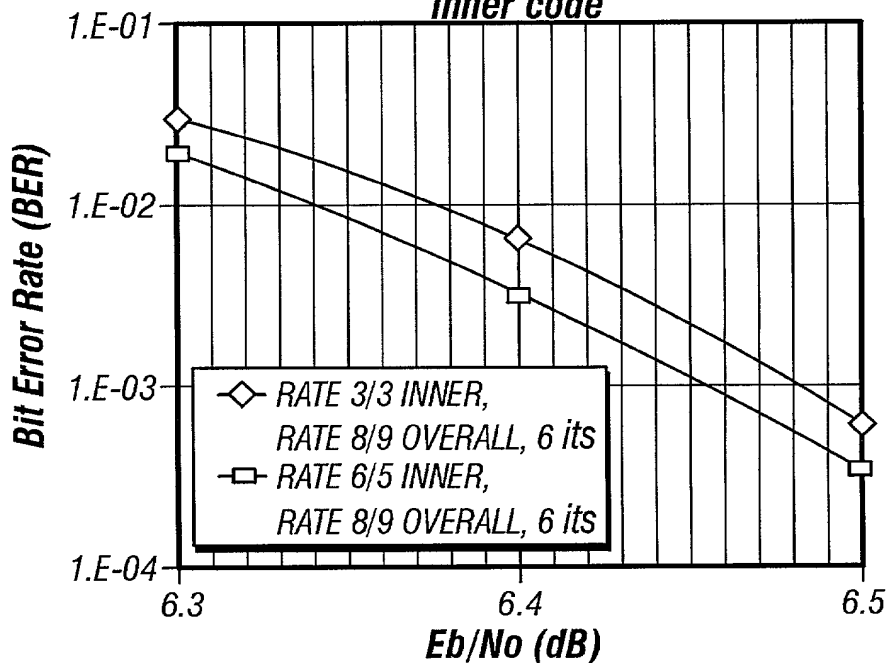


FIG. 13D

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER

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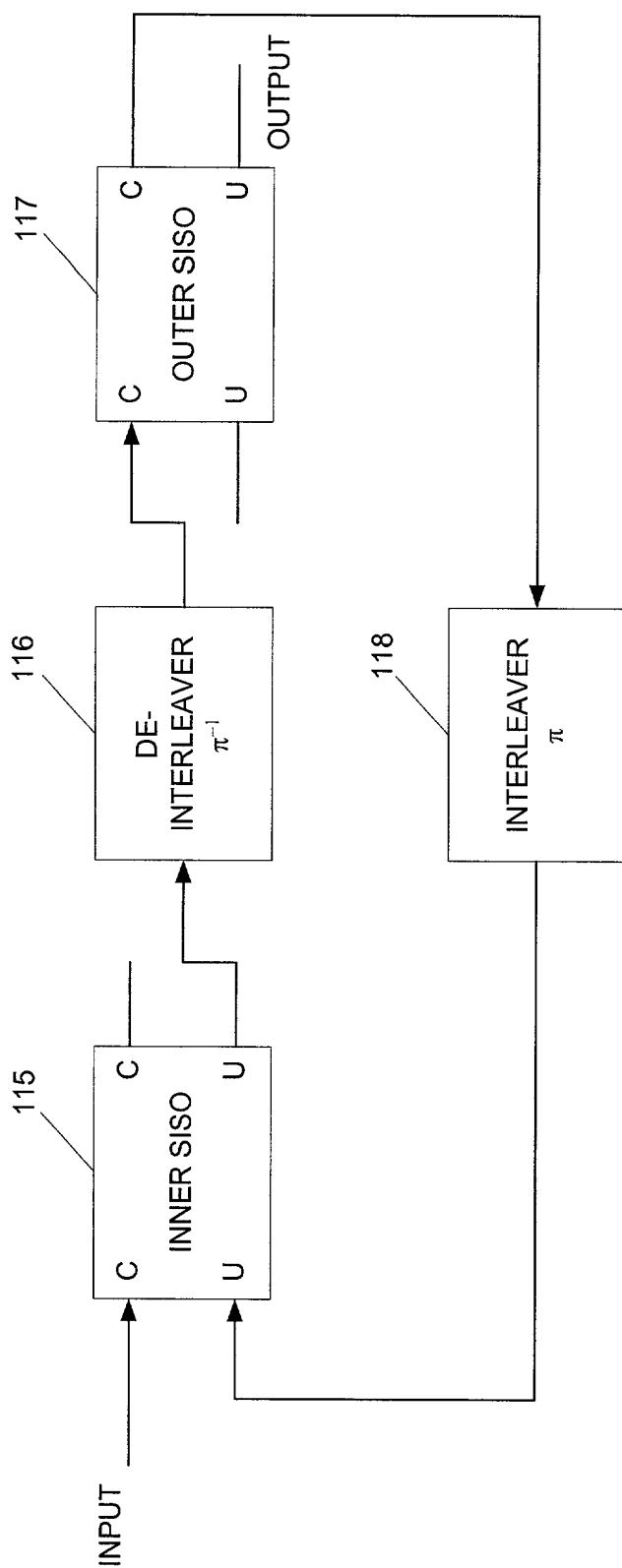


FIGURE 14

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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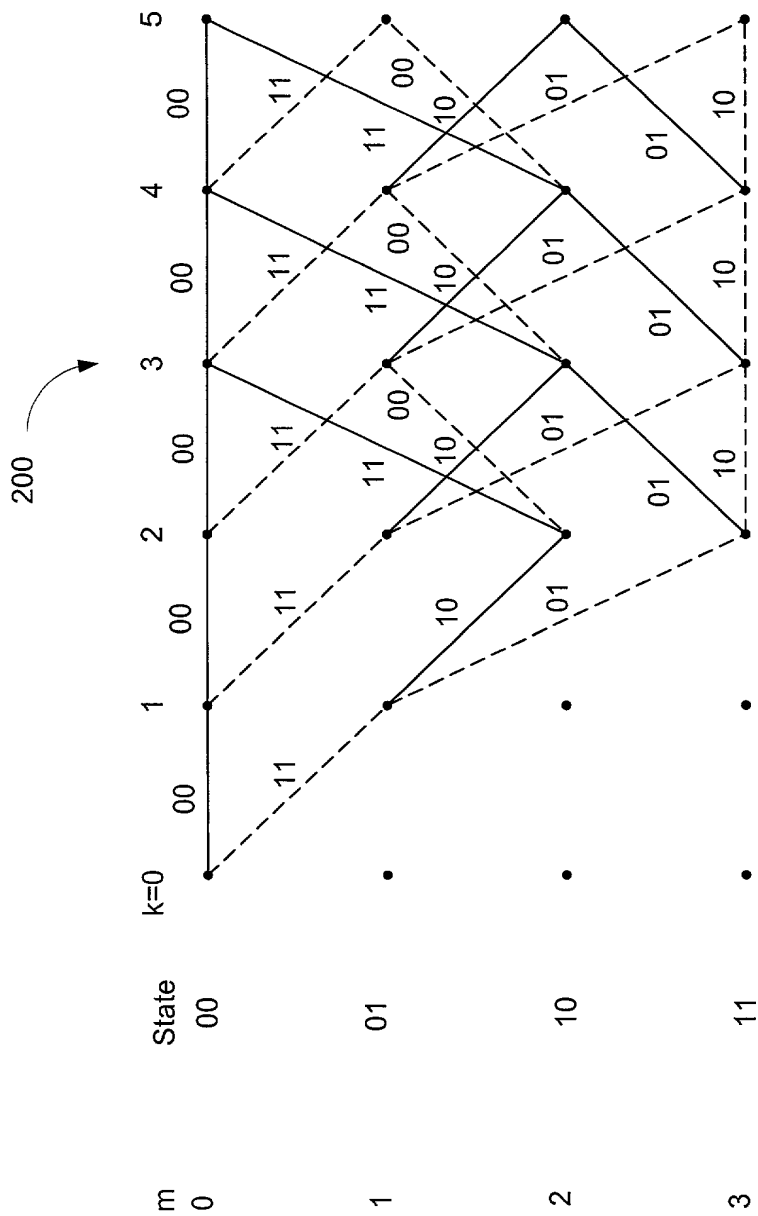


FIGURE 15

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
ENCODER AND CORRESPONDING DECODER

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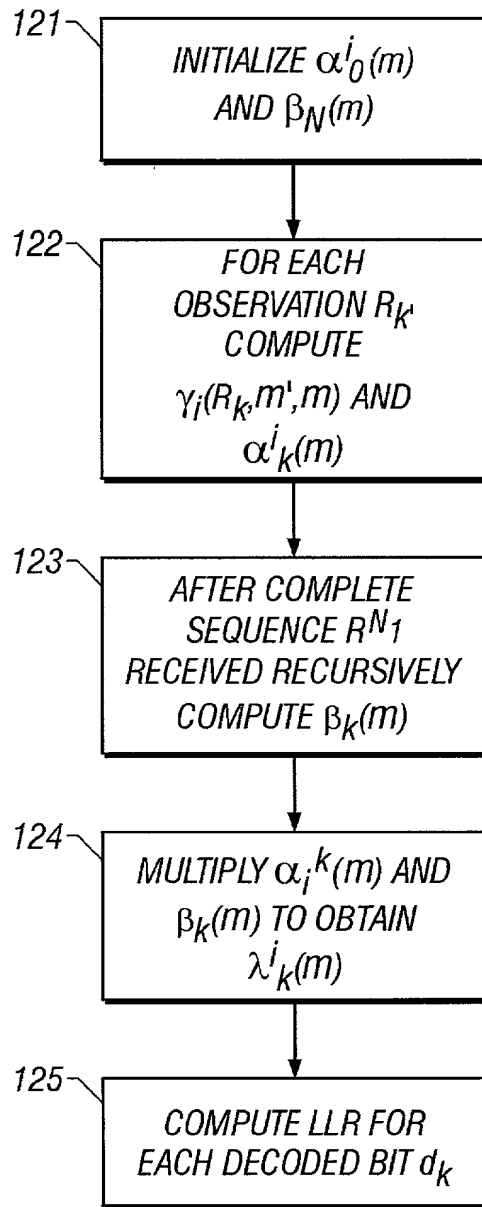


FIG. 16

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL  
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